Calibration of microphones using the liquid-column-type sound pressure generator

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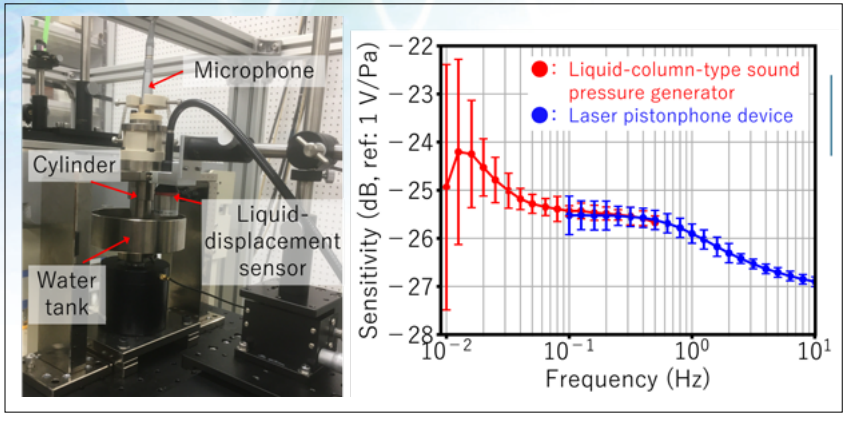
Infrasound, acoustic waves with frequencies below 20 Hz, is generated by large-scale phenomena such as volcanic explosions, tsunamis, and nuclear explosions. To ensure the reliability and traceability of infrasound measurements, calibration of infrasound sensors is essential.

NMIJ has been dedicated to establishing acoustic standards for infrasound and calibrating the sensitivity of microphones using a laser pistonphone calibration device. However, this device has a critical limitation: sound pressure leakage from the moving piston. Although we proposed an improved correction method for this leakage, deterioration of the signal-to-noise ratio below 0.1 Hz was inevitable.

To address this challenge, NMIJ has developed a liquid-column-type sound pressure generator specially designed for calibration in the infrasonic frequency range. This system uniquely uses low-frequency vibration of a liquid column to generate sound pressure. By sealing the pressure generation port with liquid, the system eliminates sound pressure leakage. Using this system, NMIJ has successfully achieved calibration of microphones down to 0.01 Hz. The next step is to calibrate a variety of infrasound sensors installed in monitoring systems using microphones calibrated with this system as reference standards.



Reference:
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